

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

**SUPPLEMENTAL SPECIFICATION**

*Addition to the Standard Specifications:*

**Section 941—Macro-Synthetic Fibers for Concrete  
Reinforcement**

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**941.1 General Description**

This section includes the requirements for manufacturing macro-synthetic fibers which are permitted as reinforcement in lieu of steel reinforcement in the following selected precast concrete products:

- Precast concrete manhole riser sections
- Precast concrete flared end sections

**941.1.01 Related References**

**A. Standard Specifications**

[Section 866—Precast Concrete Catch Basin, Drop Inlet, and Manhole Units](#)

**B. Referenced Documents**

ASTM C 1116

ASTM C 1399

ASTM D 3822

[QPL 86](#)

GDOT Standard 1120

**941.2 Materials**

For a list of sources, see [QPL 86](#).

**941.2.01 Macro-Synthetic Fibers for Concrete Reinforcement**

**A. Requirements**

1. Ensure that macro-synthetic fibers are manufactured from virgin polyolefins (polypropylene and polyethylene) and comply with ASTM C 1116.4.1.3. Fibers manufactured from materials other than polyolefins must show documentary evidence confirming their long term resistance to deterioration when in contact with the moisture and alkalies present in cement paste and/or the substances present in air-entraining and chemical admixtures.
2. The minimum fiber length required is 1.50 in (38 mm).
3. Ensure that macro-synthetic fibers have an aspect ratio (length divided by the equivalent diameter of the fiber) between 45 and 150.

**B. Acceptance**

1. Ensure that macro-synthetic fibers have a minimum tensile strength of 40 ksi (276 MPa) when tested in accordance with ASTM D 3822.
2. Minimum dosage rate in pounds of fibers per cubic yard is established by determining a minimum average residual strength of no less than 150 psi (1034 kPa) when tested in accordance with ASTM C 1399. In all cases, ensure a minimum fiber dosage rate of 5 lbs/yd<sup>3</sup> (2.9 kg/m<sup>3</sup>) and a maximum fiber dosage rate of 10 lbs/yd<sup>3</sup> (5.9 kg/m<sup>3</sup>).
3. Ensure that macro-synthetic fibers have a minimum modulus of elasticity of 400 ksi (2758 MPa) when tested in accordance with ASTM D 3822.
4. The fiber manufacturer is required to obtain independently performed test results that confirm the requirements listed herein and submit those for approval by the Engineer.
5. Approved fibers are listed on the Department's [Qualified Products List 86 \(QPL-86\), "Macro-Synthetic Fibers for Concrete Reinforcement"](#).

**C. Materials Warranty**

General Provisions 101 through 150.